

**... Fire Protection by Computer Design**

EASTERN FIRE PROTECTION  
170 KITTY HAWK AVE  
AUBURN, ME 04210  
207-784-1507

Job Name : 62 INDIA ST.  
Drawing : WOOD/STEEL  
Location : 4TH FL. UNIT 406  
Remote Area : 4  
Contract : 5583  
Data File : 62 INDIA ST. 4TH FL. 406 CALC..WXF

HYDRAULIC DESIGN INFORMATION SHEET

Name - 62 INDIA STREET Date - 6/7/17  
Location - 4TH FL. UNIT 406  
Building - WOOD/STEEL System No. - 4  
Contractor - EASTERN FIRE Contract No. - 5583  
Calculated By - EWM Drawing No. - 1 OF 3  
Construction: (X) Combustible ( ) Non-Combustible Ceiling Height 8'-6"  
OCCUPANCY - RESIDENTIAL

S Type of Calculation: (X)NFPA 13 Residential ( )NFPA 13R ( )NFPA 13D  
Y Number of Sprinklers Flowing: ( )1 ( )2 (X)4 ( )  
S ( )Other  
T ( )Specific Ruling Made by Date  
E  
M Listed Flow at Start Point - 20 Gpm System Type  
Listed Pres. at Start Point - 16.7 Psi (X) Wet ( ) Dry  
D MAXIMUM LISTED SPACING 20 x 20 ( ) Deluge ( ) PreAction  
E Domestic Flow Added - Gpm Sprinkler or Nozzle  
S Additional Flow Added - 250 Gpm Make RELIABLE Model RFC49  
I Elevation at Highest Outlet - 75.52Feet Size 1/2" K-Factor 4.9  
G Note: Temperature Rating 200\*  
N

Calculation Gpm Required 185.508 Psi Required 67.740 At Test  
Summary C-Factor Used: Overhead 150 Underground 150

W Water Flow Test: Pump Data: Tank or Reservoir:  
A Date of Test - 7/6/16 Rated Cap. Cap.  
T Time of Test - @ Psi Elev.  
E Static (Psi) - 95 Elev.  
R Residual (Psi) - 88 Other Well  
Flow (Gpm) - 1582 Proof Flow Gpm  
S Elevation - 34.5

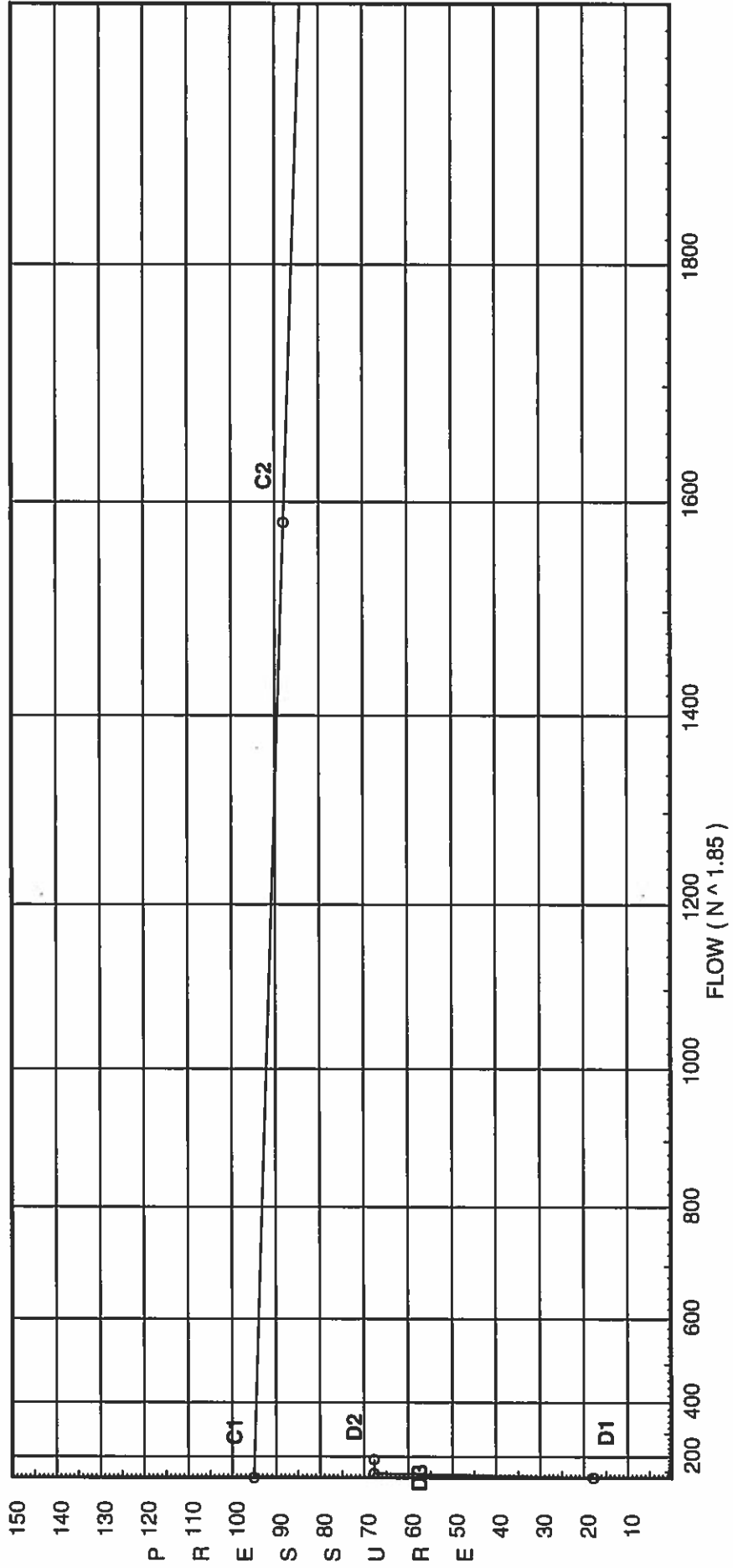
P Location: PORTLAND, ME.  
P  
L Source of Information: PORTLAND WATER DISTRICT  
Y

# Water Supply Curve C

EASTERN FIRE PROTECTION  
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City Water Supply:  
C1 - Static Pressure : 95  
C2 - Residual Pressure: 88  
C2 - Residual Flow : 1582

Demand:  
D1 - Elevation : 17.766  
D2 - System Flow : 85.508  
D2 - System Pressure : 67.740  
Hose ( Demand ) : 100  
D3 - System Demand : 185.508  
Safety Margin : 27.127



# Fittings Used Summary

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Fitting Legend Abbrev. Name	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24	
B	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0	
E	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61	
Fsp	Fitting generates a Fixed Loss Based on Flow																				
G	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13	
I	0	0	2	3	4	3.5	6	5	8	7	8.5	10	13	17	20	23	25	33	36	40	
J	0	0	4.5	6	8	8.5	10.8	13	17	16	21	25	33	41	50	65	78	88	98	120	
N*	7	7	7	8	9	11	12	13	0	0	0	0	0	0	0	0	0	0	0	0	
O*	3	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0	
S	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65	71	81	91	101	121	
T	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121	

## Units Summary

Diameter Units	Inches
Length Units	Feet
Flow Units	US Gallons per Minute
Pressure Units	Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with \*. The fittings marked with a \* show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a \* will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFFPA.

**SUPPLY ANALYSIS**

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
TEST	95.0	88	1582.0	94.867	185.51	67.74

**NODE ANALYSIS**

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>
500	75.52	4.9	16.7	20.02	
501	75.52	4.9	17.93	20.75	
502	76.02		18.75		
503	75.52	4.9	19.54	21.66	
504	76.02		20.72		
505	75.52	4.9	22.17	23.07	
407	76.02		24.82		
408	76.02		31.04		
409	76.02		33.48		
411	76.02		33.63		
412	76.02		36.79		
413	76.02		41.09		
114	44.44		54.89		
TOR1	44.44		55.22		
HDR1	37.5		58.39		
BASE	34.5		67.71		
TEST	34.5		67.74	100.0	

Final Calculations - Hazen-Williams - 2007

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
500 to 502	75.520 76.020	4.90	20.02 20.02	1 1.101	2N	14.0 0.0	19.290 14.000	150	16.700 -0.217			
			0.0			0.0	33.290	0.0682	2.271	Vel =	6.75	
502			20.02						18.754	K Factor =	4.62	
501 to 502	75.520 76.020	4.90	20.75 20.75	1 1.101	N O	7.0 5.0	2.290 12.000	150	17.930 -0.217			
						0.0	14.290	0.0728	1.041	Vel =	6.99	
502 to 504	76.020 76.020		20.02 40.77	1 1.101		0.0 0.0	7.750 0.0	150	18.754 0.0			
			0.0			0.0	7.750	0.2541	1.969	Vel =	13.74	
504			40.77						20.723	K Factor =	8.96	
503 to 504	75.520 76.020	4.90	21.66 21.66	1 1.101	N O	7.0 5.0	5.710 12.000	150	19.543 -0.217			
						0.0	17.710	0.0789	1.397	Vel =	7.30	
504 to 505	76.020 75.520		40.77 62.43	1 1.101		0.0 0.0	2.210 0.0	150	20.723 0.217			
						0.0	2.210	0.5588	1.235	Vel =	21.04	
505 to 407	75.520 76.020	4.90	23.08 85.51	1.25 1.394		0.0 0.0	9.040 0.0	150	22.175 -0.217			
						0.0	9.040	0.3170	2.866	Vel =	17.98	
407 to 408	76.020 76.020		0.0 85.51	1.5 1.598	O	8.0 0.0	30.125 8.000	150	24.824 0.0			
						0.0	38.125	0.1630	6.214	Vel =	13.68	
408 to 409	76.020 76.020		0.0 85.51	2 2.003	N O	11.0 10.0	24.080 21.000	150	31.038 0.0			
						0.0	45.080	0.0543	2.446	Vel =	8.71	
409 to 411	76.020 76.020		0.0 85.51	2.5 2.423		0.0 0.0	6.625 0.0	150	33.484 0.0			
						0.0	6.625	0.0214	0.142	Vel =	5.95	
411 to 412	76.020 76.020		0.0 85.51	2.5 2.423	O 2N	12.0 24.0	111.580 36.000	150	33.626 0.0			
						0.0	147.580	0.0215	3.168	Vel =	5.95	
412 to 413	76.020 76.020		0.0 85.51	2.5 2.635	B I S T Fsp	9.61 8.237 19.22 16.474 0.0	6.790 53.541 60.331 0.0	120	36.794 3.000 1.301	** Fixed Loss = 3	Vel =	5.03
413 to 114	76.020 44.440		0.0 85.51	4 4.26	T	26.334 0.0	31.590 26.334	120	41.095 13.677			
						0.0	57.924	0.0021	0.120	Vel =	1.92	
114 to TOR1	44.440 44.440		0.0 85.51	4 4.26	B 3I J	15.8 27.651 21.067	95.360 64.518 159.878	120	54.892 0.0 0.332		Vel =	1.92
TOR1 to HDR1	44.440 37.500		0.0 85.51	4 4.26	B S T	15.8 28.968 26.334	6.940 71.102 78.042	120	55.224 3.006 0.162		Vel =	1.92

# Final Calculations - Hazen-Williams

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Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
HDR1 to BASE	37.500 34.500		0.0 85.51	4 4.26		0.0 0.0	9.250 0.0	120	58.392 9.299		** Fixed Loss = 8	
BASE to TEST	34.500 34.500		0.0 85.51	6 6.16	E T 2G	20.084 43.037 8.607	40.000 71.728 111.728	140	67.711 0.0 0.029		Vel = 1.92	
TEST			100.00 185.51						67.740		Qa = 100.00 K Factor = 22.54	